

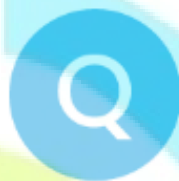


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## QUIZZES

Practice Test-1 (Chromosomes and DNA)



10 Questions



7 min

### Topics

Chromosomes (Number, Structure, Composition and Organization), Concept of gene, DNA as heredity material

**SAEED MDCAT**

Start Quiz

**SAEED MDCAT TEAM**



**SAEEDMDCAT**

06 : 59



Q

1/10



7 min



Hint

Q : Chromosomes may vary in:

A

Their size

B

Staining properties

C

Location of centromere

D

All A, B, C

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

1

2

3

4

5

6

7



2/10



7 min



Hint

Q : Which of the following option is correct with respect to the chemical composition of chromosomes?

A

40% proteins and 60% DNA

B

40% DNA and 60% proteins

C

50% of each DNA and proteins

D

20% DNA and 80% proteins

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7



Q

3/10



7 min



Hint

Q : Nucleosome consists of:

A

Complex of 200 nucleotides and 8 histones molecules

B

Complex of 400 nucleotide pairs and 8 histones molecules

C

Complex of 100 nucleotides and Variable histones molecules

D

Complex of variable nucleotides and Variable histones molecules

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7



Q

4/10



7 min



Hint

Q : Histones are positively charged due to the abundance of:

A

Acidic amino acids

B

Aromatic amino acids

C

Basic amino acids

D

Non-polar and neutral amino acids

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7

06 : 55



Q

5/10



7 min



Hint

Q : Highly condensed portion of the chromatin is:

A

Euchromatin

B

Satellite DNA

C

Heterochromatin

D

Chromatin fiber

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

1

2

3

4

5

6

7



Q

6/10



7 min



Hint

Q : The particular place of the chromosome where a gene is located is called:

A

Elementen

B

Heredity factor

C

Locus

D

Transposons

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7



7/10



7 min



Hint

Q : The amount of DNA in a diploid cell is:



Variable for a given species



Constant for a given species



Same in all species of plants



Same in all species of animals

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7





8/10



7 min



Hint

Q : The carbohydrate component of nucleic acid is:



Hexose



Pentose



Heptose



Triose

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT



Q

9/10



7 min



Hint

Q : If the % of adenine in ds-DNA molecule is 20%, then the % of guanine is:

A

80%

B

20%

C

30%

D

40%

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

4

5

6

7

8

9

10



Q

10/10



7 min



Hint

Q : X-Ray diffraction pattern of DNA was first prepared by:

A

Watson and Crick

B

Rosalind Franklin

C

Erwin Chargaff

D

Maurice Wilkins

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

4

5

6

7

8

9

10



Correct



Unattempted



Incorrect



1/10

Q : Chromosomes may vary in:



Their size



Staining properties



Location of centromere



All A, B, C

Explanation

Chromosomes may widely differ in appearance. They vary in size, staining properties, the location of centromere, relative lengths of the two arms on either side of chromosomes and the position of constricted regions along with the arms.



Correct



Unattempted



Incorrect



2/10

Q : Which of the following option is correct with respect to the chemical composition of chromosomes?



40% proteins and 60% DNA



40% DNA and 60% proteins



50% of each DNA and proteins



20% DNA and 80% proteins

SAEED MDCAT TEAM

Explanation



SAEEDMDCAT

Mostly Chromosomes are composed of 40% DNA and 60% proteins. A significant amount of RNA is also associated with the chromosomes.



Correct



Unattempted



Incorrect



3/10

Q : Nucleosome consists of:



Complex of 200 nucleotides and 8 histones molecules



Complex of 400 nucleotide pairs and 8 histones molecules



Complex of 100 nucleotides and Variable histones molecules



Complex of variable nucleotides and Variable histones molecules

Explanation

Nucleosome is the structural unit of a eukaryotic chromosome, consisting of a length of DNA coiled around a core of histones. Every 200 nucleotides, the DNA duplex are coiled around a core of eight histone proteins.



Correct



Unattempted



Incorrect



4/10

Q : Histones are positively charged due to the abundance of:



Acidic amino acids



Aromatic amino acids



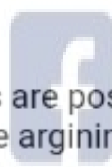
Basic amino acids



Non-polar and neutral amino acids

SAEED MDCAT

Explanation  
SAEED MDCAT TEAM



SAEEDMDCAT

Histones are positively charged due to the abundance of basic amino acids like arginine and lysine.



Correct



Unattempted



Incorrect



5/10

Q : Highly condensed portion of the chromatin is:



Euchromatin



Satellite DNA



Heterochromatin



Chromatin fiber

Explanation

Heterochromatin has condensed chromatin structure and is inactive for transcription, while euchromatin has loose chromatin structure and is active for transcription.





Correct



Unattempted



Incorrect



6/10

Q : The particular place of the chromosome where a gene is located is called:



Elementen



Heredity factor



Locus



Transposons

SAEED MDCAT TEAM

Explanation



SAEEDMDCAT

In *genetics*, a *locus* is a specific, fixed position on a chromosome where a particular gene or *genetic* marker is located.



Correct



Unattempted



Incorrect



7/10

Q : The amount of DNA in a diploid cell is:



Variable for a given species



Constant for a given species



Same in all species of plants



Same in all species of animals

Explanation

As all organisms of one species have same number of chromosomes in them (46 in all humans), so their DNA amount is almost same in all diploid cells of body.



## Practice Test-1 (Chromosomes and DNA)



Correct



Unattempted



Incorrect



8/10

Q : The carbohydrate component of nucleic acid is:

A

Hexose

B

Pentose

C

Heptose

D

Triose

# SAEED MDCAT

Explanation

## SAEED MDCAT TEAM

Nucleic acids includes DNA and RNA which are the polymers of nucleotides. Each of the nucleotide is further composed of three main components which are;

- Nitrogenous base
- Pentose sugar
- Phosphate group/s

4

5

6

7

8

9

10



Correct



Unattempted



Incorrect



9/10

Q : If the % of adenine in ds-DNA molecule is 20%, then the % of guanine is:



80%



20%



30%

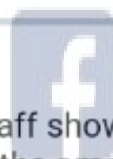


40%

SAEED MDCAT

SAEED MDCAT TEAM

Explanation



SAEEDMDCAT

E. Chargaff showed that the amount of adenine in DNA is always equal to the amount of thymine and the amount of guanine is always equal to the amount of cytosine. It also implies that there is always equal proportion of purines (A+G) and pyrimidines (C+T).



Correct



Unattempted



Incorrect



10/10

Q : X-Ray diffraction pattern of DNA was first prepared by:



Watson and Crick



Rosalind Franklin



Erwin Chargaff



Maurice Wilkins

SAEED MDCAT

SAEED MDCAT TEAM

Explanation



SAEEDMDCAT

Rosalind Franklin's X-ray diffraction patterns of DNA molecules rendered the important clue that DNA has the structure of a double helix.

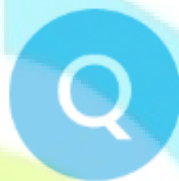


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## QUIZZES

Practice Test-2 (Chromosomes and DNA)



10 Questions



7 min

### Topics

Model of DNA replication, Meselson-Stahl's Experiment, Process of DNA Replication

SAEED MDCAT

Start Quiz

SAEED MDCAT TEAM



SAEEDMDCAT



Q

1/10



7 min



Hint

Q : DNA replication is best explained by which of the following hypotheses?

A

Conservative replication

B

Semi-conservative replication

C

Dispersive replication

D

Semi-dispersive replication

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7

06 : 58



Q

2/10



7 min



Hint

Q : Most widely accepted model for DNA replication is:

A

Conservative

B

Semi conservative

C

Modified conservative

D

Dispersive

**SAEED MDCAT**

**SAEED MDCAT TEAM**



**SAEEDMDCAT**

1

2

3

4

5

6

7





3/10



7 min



Hint

Q : The chemical used by Meselson and Stahl to create density gradient is:

A

NaCl

B

SiC

C

CsCl

D

CaCl<sub>2</sub>

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7



4/10



7 min



Hint

Q : If the length of a prokaryotic DNA strand is 20000 base pairs. How much time will DNA polymerase take to thread through it?

A

5 seconds

B

10 seconds

C

15 seconds

D

20 seconds

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7

06 : 55



Q

5/10



7 min



Hint

Q : Length of Okazaki fragments in prokaryotes is:

A

100-200 nucleotides

B

1000-3000 nucleotides

C

1000-2000 nucleotides

D

200-300 nucleotides

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

1

2

3

4

5

6

7



6/10



7 min



Hint

Q : DNA replication model presented by Watson and Crick is:

A

Conservative replication

B

Semi-conservative replication

C

Dispersive replication

D

Scale model

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

1

2

3

4

5

6

7



Q

7/10



7 min



Hint

Q : DNA double helix is opened by:

A

Primase

B

DNA polymerase

C

Helicase

D

Ligase

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

06 : 50



Q

8/10



7 min



Hint

Q : DNA replication occurs in \_\_\_\_\_ part/parts of a eukaryotic cell:

A

Mitochondria

B

Nucleus

C

Chloroplast

D

All A, B, C

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

4

5

6

7

8

9

10



Q

9/10



7 min



Hint

Q : What is the fate of primer after DNA replication?

A

Remains as such

B

Replaced by RNA nucleotides

C

Replaced by DNA nucleotides

D

Permanently degraded

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT



Q

10/10



7 min



Hint

Q : The true *E. coli* replicating enzyme is DNA polymerase:

A

I

B

III

C

II

D

IV

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

4

5

6

7

8

9

10





Correct



Unattempted



Incorrect



1/10

Q : DNA replication is best explained by which of the following hypotheses?



Conservative replication



Semi-conservative replication



Dispersive replication



Semi-dispersive replication

SAEED MDCAT TEAM

Explanation



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DNA replication process involves unwinding or unzipping of duplex and then simply adding complementary nucleotides on the single stranded templates



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Incorrect



2/10

Q : Most widely accepted model for DNA replication is:

A

Conservative

B

Semi conservative

C

Modified conservative

D

Dispersive

SAEED MDCAT

Explanation

SAEED MDCAT TEAM





Correct

Unattempted

Incorrect



3/10

Q : The chemical used by Meselson and Stahl to create density gradient is:

A

NaCl

B

SiC

C

CsCl

D

CaCl<sub>2</sub>

SAEED MDCAT

Explanation

SAEED MDCAT TEAM

- The chemical used by Meselson and Stahl to create density gradient was CsCl
- SiC needles are used to create holes in the egg cell during vortex mixing method.
- CaCl<sub>2</sub> is used enhance the uptake to recombinant DNA by the competent bacteria.



Correct



Unattempted



Incorrect



4/10

Q : If the length of a prokaryotic DNA strand is 20000 base pairs. How much time will DNA polymerase take to thread through it?



5 seconds



10 seconds



15 seconds



20 seconds

SAEED MDCAT TEAM

Explanation



SAEEDMDCAT

The speed of polymerization of DNA pol. III is 1000 nucleotides per second.



Correct



Unattempted



Incorrect



5/10

Q : Length of Okazaki fragments in prokaryotes is:



100-200 nucleotides



1000-3000 nucleotides



1000-2000 nucleotides



200-300 nucleotides

Explanation

Each fragment on lagging strand of prokaryotes has 1000 to 2000 nucleotides.



Correct



Unattempted



Incorrect



6/10

Q : DNA replication model presented by Watson and Crick is:



Conservative replication



Semi-conservative replication



Dispersive replication



Scale model

Explanation

According to Watson and Crick, DNA replicates by *Semi conservative replication*. The sequence of the original duplex is conserved after one round of replication, the duplex itself is not.



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Incorrect



7/10

Q : DNA double helix is opened by:



Primase



DNA polymerase



Helicase

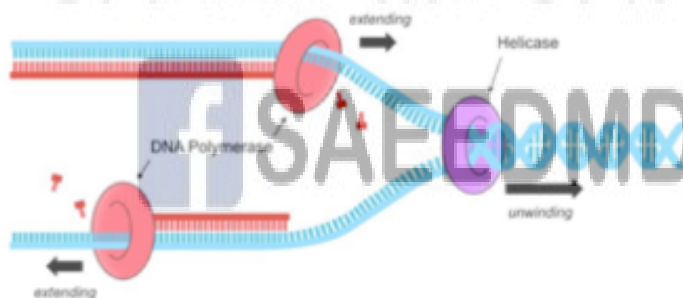


Ligase

SAEED MDCAT

Explanation

SAEED MDCAT TEAM







Correct



Unattempted



Incorrect



8/10

Q : DNA replication occurs in \_\_\_\_\_ part/parts of a eukaryotic cell:



Mitochondria



Nucleus



Chloroplast



All A, B, C

Explanation

All are self-replicating organelles.





Correct



Unattempted



Incorrect



9/10

Q : What is the fate of primer after DNA replication?



Remains as such



Replaced by RNA nucleotides



Replaced by DNA nucleotides



Permanently degraded

Explanation

These RNA primers are converted into DNA strands by DNA polymerase I.



Correct



Unattempted



Incorrect



10/10

Q : The true *E. coli* replicating enzyme is DNA polymerase:



I



III



II



IV

SAEED MDCAT

SAEED MDCAT TEAM

Explanation

The true *E. coli* replicating enzyme is DNA polymerase III, which is 10 times larger. Rate of replications is 1000 nucleotides / sec

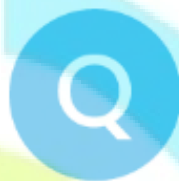


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## QUIZZES

Practice Test-3 (Chromosomes and DNA)



10 Questions



7 min

### Topics

Central dogma of gene expression,  
Transcription, Genetic code, Translation,  
Mutation

# SAEED MDCAT

Start Quiz

## SAEED MDCAT TEAM



## SAEEDMDCAT



Q

1/10



7 min



Hint

Q : Amino acid binds with tRNA at:

A

Anticodon site

B

3' end

C

Recognition site

D

5' end

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

06 : 58



Q

2/10



7 min



Hint

Q : Which of the following RNA is involved in protein synthesis?

A

mRNA

B

rRNA

C

tRNA

D

All A, B, C

**SAEED MDCAT**

**SAEED MDCAT TEAM**



**SAEEDMDCAT**

1

2

3

4

5

6

7



3/10



7 min



Hint

Q : During transcription, RNA polymerase binds at:

A

Replication fork

B

Start codon

C

Primer site

D

Promoter site

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT



Q

4/10



7 min



Hint

Q : During transcription, the termination of mRNA synthesis is done by?

A

Anti codon

B

Stop codon

C

Stop sequence

D

Release factor

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT



Q

5/10



7 min



Hint

Q : In bacterial cell, AGA codon specifies:

A

Methionine

B

Isoleucin

C

Tryptophan

D

Arginine

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT





6/10



7 min



Hint

Q : The codon AUG has dual function as it codes for \_\_\_\_ and also acts as a \_\_\_\_ codon.

A

Phenylalanine, initiator

B

Methionine, regulator

C

Methionine, terminator

D

Methionine, initiator

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT



Q

7/10



7 min



Hint

Q : Non sense codons on mRNA are recognized by:

A

tRNA with anticodons

B

Release factors

C

Initiation factors

D

Elongation factors

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT



Q

8/10



7 min



Hint

Q : The formation of peptide bond between two adjacent amino acids during translation in mitochondria is catalyzed by:

A

30 S subunit

B

40 S subunit

C

50 S subunit

D

60 S subunit

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

4

5

6

7

8

9

10



Q

9/10



7 min



Hint

Q : Point mutations can be the result of:

A

DNA replication

B

Addition of gene

C

Deletion of a part of chromosome

D

Presence of Aneupliody

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

4

5

6

7

8

9

10



10/10



7 min



Hint

Q : Which amino acid is found abnormally in sickle cells' haemoglobin at position 6?

A

Glutamic acid in  $\alpha$  chain

B

Valine in  $\alpha$  chain

C

Glutamic acid in  $\beta$  chain

D

Valine in  $\beta$  chain

# SAEED MDCAT

## SAEED MDCAT TEAM



## SAEEDMDCAT

4

5

6

7

8

9

10



Q : Amino acid binds with tRNA at:

A

Anticodon site

B

3' end

C

Recognition site

D

5' end

Explanation





Incorrect



2/10

Q : Which of the following RNA is involved in protein synthesis?

A

mRNA

B

rRNA

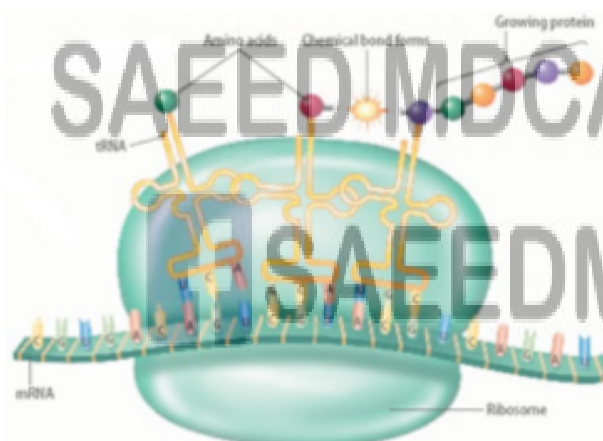
C

tRNA

D

All A, B, C

Explanation





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Incorrect



3/10

Q : During transcription, RNA polymerase binds at:

A

Replication fork

B

Start codon

C

Primer site

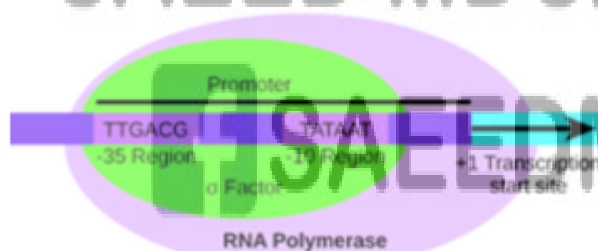
D

Promoter site

SAEED MDCAT

Explanation

SAEED MDCAT TEAM







Correct



Unattempted



Incorrect



4/10

Q : During transcription, the termination of mRNA synthesis is done by?



Anti codon



Stop codon



Stop sequence



Release factor

Explanation

The termination of transcription is followed by the stop signal that is a series of GC sequence followed by series of AT sequence.



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Q : In bacterial cell, AGA codon specifies:

A Methionine

B Isoleucin

C Tryptophan

D Arginine

### Explanation

		Second letter				First letter	Third letter
		U	C	A	G		
U	UUU	Phe	UCU	UAU	UGU	Cys	U
	UUC		UCC	UAC	UGC		C
	UUA	Leu	UCA	UAA	UGA	Stop	A
	UUG		UCG	UAG	UGG	Trp	G
C	CUB		CCU	CAU	CGU	Arg	U
	CUC		CCC	CAC	CGC		C
	CUA	Leu	CCA	CAA	CGA		A
	CUG		CCG	CAG	CGG		G
A	AUU	Ile	ACU	AAU	AGU	Ser	U
	AUC		ACC	AAC	AGC		C
	AUA		ACA	AAA	AGA	Arg	A
	AUG	Met	ACG	AAG	AGG		G
G	GUU	Val	GCU	GAU	GGU	Gly	U
	GUC		GCC	GAC	GGC		C
	GUA		GCA	GAA	GGA		A
	GUG		GCG	GAG	GGG		G



Incorrect



6/10

Q : The codon AUG has dual function as it codes for \_\_\_\_ and also acts as a \_\_\_\_ codon.

A

Phenylalanine, initiator

B

Methionine, regulator

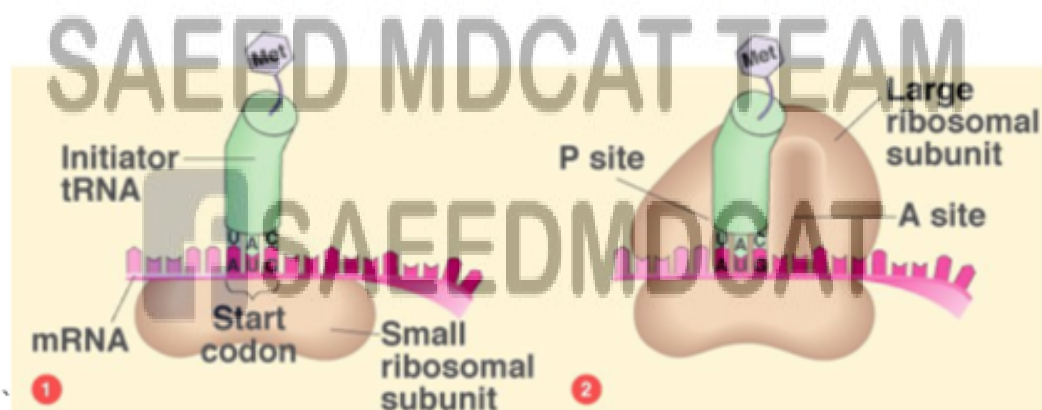
C

Methionine, terminator

D

Methionine, initiator

Explanation





Correct



Unattempted



Incorrect



7/10

Q : Non sense codons on mRNA are recognized by:



tRNA with anticodons



Release factors



Initiation factors



Elongation factors

SAEED MDCAT

Explanation

SAEED MDCAT TEAM





Correct



Unattempted



Incorrect



8/10

Q : The formation of peptide bond between two adjacent amino acids during translation in mitochondria is catalyzed by:



30 S subunit



40 S subunit



50 S subunit



60 S subunit

SAEED MDCAT TEAM

Explanation



SAEEDMDCAT

Larger sub unite of mitochondrial ribosome has peptidyltransferase enzyme that makes peptide group between amino acids and make polypeptide chain.



Correct



Unattempted



Incorrect



9/10

Q : Point mutations can be the result of:



DNA replication



Addition of gene



Deletion of a part of chromosome



Presence of Aneuploidy

SAEED MDCAT

Explanation

SAEED MDCAT TEAM



FIGURE 15.8 Unrepaired Mistakes in DNA Synthesis Lead to Point Mutations.



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Incorrect



10/10

Q : Which amino acid is found abnormally in sickle cells' haemoglobin at position 6?

A

Glutamic acid in  $\alpha$  chain

B

Valine in  $\alpha$  chain

C

Glutamic acid in  $\beta$  chain

D

Valine in  $\beta$  chain

SAEED MDCAT

Explanation

SAEED MDCAT TEAM

